

Thos. Penrose

From the Author

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ON INSTINCT.

SYNOPSIS.

1. DEFINITION.—2. In what does instinct differ from reason, habit, or mechanism.—3. Do the instances of the apparent combinations of ideas in brute animals, where they effect their purposes by extraordinary means, shew that they have reason as well as instinct?



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ON INSTINCT.

THE author of the article *Instinct* in the British Encyclopædia has defined it to be, “that power or disposition of the mind by which, independent of all instruction or experience, without deliberation, and without having any end in view, animals are unceasingly directed to do spontaneously whatever is necessary for the preservation of the individual or the continuation of the kind.”

Dr. Johnson defines it to be desire or aversion acting in the mind without the intervention of reason or deliberation.

Reid says, “instinct is a natural blind impulse to certain actions, without having any end in view, without deliberation, and often without a conception of what is done.”

Paley affirms that it is “a propensity prior to experience, and independent of instruction.”

Lord Monboddo asserts that the “instinct of brutes proceeds without deliberation, or the consideration of means and ends.”

Dr. Darwin defines instinct thus: “All those actions of men and animals which are attended with consciousness, and seem neither to have been directed by their appetites, taught by their experience, nor deduced from observation or tra-

“ dition, have been referred to the power of instinct. And this power has been explained to “ to be a divine something, a kind of inspiration ; “ whilst the poor animal that possesses it has been “ thought little better than a machine.”

Thus we see that almost all the definitions of writers agree in this assertion, that the acts ascribed to instinct are done without deliberation, and without an end in view.

It may be asked, what means the word *deliberation* ? and if it be answered, the consideration of an act to be performed, who shall say that many of the acts of the inferior animals do not exhibit signs of deliberation ? Do not birds consider the nature, the size, the quantity of materials they are about to select for their nests ; when the exterior of their buildings is sufficiently finished, to furnish the interior with the appropriate lining of wool, hay, feathers, &c. ?

Who can say that the bee does not consider the height, breadth, thickness of the cells in the course of its operations ?

Next, as to the contemplation of the end in view, why should we say that the bird, which shews so much anxiety when her nest is destroyed, is not aware of its essential purpose ? Is not the dog, which hunts instinctively on scent, aware that the end it has in view is the catching its prey ? Does not the wasp, which by instinct is taught to use its sting as a weapon of defence, know that the end for which he uses it is to inflict pain on its enemy ? Do not the various contrivances of spiders in mending their webs shew deliberation and a

consideration of an useful purpose, and exhibit as much speculation and ingenuity as a tailor does in repairing a tattered garment? In short, is instinct a totally different faculty from reason? Are brute animals mere machines, and is every act they perform guided by the inspiration of their all-wise and benevolent Creator? It may be then asked, were all the actions of our first parents in paradise instinctive, which (according to Paley's definition) were prior to experience, and independent of all instruction but divine, which Pope makes the true characteristic of instinct?

In this 'tis God directs, in that 'tis man.

It is certain that many contradictory opinions have been entertained respecting the nature of instinct^a. Smellie says that no distinction exists between instinctive and rational motives; whilst Dr. Reld attributes even the act of breathing to instinct, which seems at first sight to confound this principle with mere mechanism; yet not wholly so, for we breathe during profound sleep, when we certainly do not exert our reason.

Reason, instinct, and habit have all been confounded together; but this distinction of them has been proposed:

Actions performed with a view to accomplish a certain end are called rational, the end in view being the motive to their performance. Instinctive actions have a cause, namely, the internal impulse by which they are spontaneously performed; but

^a Reason, when press'd, will in the field appear,
But honest instinct serves a volunteer.

they cannot be said to have a motive, because they are so extremely limited, and not done with any view beyond strictly definite consequences. Mechanical actions are performed without the spontaneity of the agent; habitual actions are carried on without attention to the motive.

Instinct is often confounded with the effects of mere mechanical structure. A camel by its organization can perceive a spring of water in the desert at half a mile distance; but it is from instinct that it lays up in its large bag, which it has in addition to four stomachs, a store of water to supply it in time of need. Leo Africanus says a camel can pass fifteen days without drinking.

There has been much vain logomachy on this subject, as on many others which are above the reach of human comprehension. The writer of the article on the instinct of insects in the Introduction to Etymology, whether he be Mr. Kirby or Mr. Spence, says, "I am quite of Bonnet's opinion, that philosophers will in vain torment themselves to define instinct, until they have spent some time in the head of an animal, without actually being that animal; a species of metempsychosis through which as I have never passed, I shall not attempt to explain this mysterious energy."

Although he does not try to explain it himself, he gives us the following various hypotheses of other writers on the subject :

Some of the philosophers of the old school, and Cudworth of late days, have referred this faculty to a certain plastic nature.

Des Cartes contended that animals were mere machines.

Mylius asserts that many of the actions deemed instinctive are the effect of painful corporeal feelings : the cocoon of a caterpillar, for instance, being the result of a fit of the colic, produced by the superabundance of the gum which fills its silk bags, and which exuding is twisted round it by its uneasy contortions into an irregular ball.

Some pupils of Winckler think that the brain, alias the soul, of a bee or spider is impressed at the birth of the insect with certain geometrical figures, according to which models its works are constructed. A position which these gentlemen demonstrate very satisfactorily by a memorable experiment, in which they themselves were able to *hear* the figures of triangles ^b.

Buffon makes instinct dependent on the external and internal structure and necessary resulting movements ; and gravely tells us, that the boasted hexagonal cells of bees are produced by the reciprocal pressure of the cylindrical bodies of these insects against each other !

Speffer, a German author, thinks it arises from “ the shootings out of inorganic animal matter.”

La Marck attributes it to certain inherent inclinations arising from habits impressed upon the organs of the animals concerned in producing them, by the constant efflux, towards these organs, of the nervous fluid, which during a series of ages has been displaced, in their endeavours to perform cer-

^b Mon. Serres on the fifth pair of nerves.

tain actions to which their necessities have given birth.

Addison and some other authors assert that instinct is an immediate and constant impulse of the Deity ; which, to omit other objections, is sufficiently refuted by the fact that animals in their instincts are sometimes at fault, and commit mistakes, which on the above supposition could not in any way happen. Flesh-flies lay their eggs in the stapelia plant, mistaking it for carrion ; and house-flies in snuff, mistaking it for cow-dung.

Lord Kaimes, in his History of Man, says, “ the
“ populace about Smyrna have a cruel amusement.
“ They lay the eggs of a hen in a stork’s nest.
“ Upon seeing the chickens, the male in amaze-
“ ment calls the neighbouring storks together, who,
“ to revenge the affront put upon them, for her
“ error, destroy the poor innocent female, while he
“ bewails his misfortune in heavy lamentation.”

Pythagoras, Plato, and other ancient philosophers, and in modern times Helvetius, Condillac, Smellie, and Darwin, contend for the identity of this faculty with reason in man.

The invariable uniformity of the arts of the inferior animals is said to prove that they proceed from some other principle than reason, forethought, or design.

“ Every manufacturing art among men,” says Reid, “ was invented by some man, improved by
“ others, and brought to perfection by time and
“ experience. Men learn to work in it by practice,
“ which produces habit. The arts of men vary in
“ every age and in every nation, and are found

“ only in those who have been taught them. The
 “ manufactures of animals differ from those of men
 “ in many striking particulars. No animal of the
 “ species can claim the invention. No animal ever
 “ introduced any new improvement or any varia-
 “ tion from the former practice. Every one has
 “ equal skill from the beginning, without teaching,
 “ without experience or habit. Every one has its
 “ art by a kind of inspiration. I do not mean that
 “ it is inspired with the principles or rules of the
 “ arts, but with the ability and inclination of work-
 “ ing in it to perfection without any knowledge of
 “ its principles, rules, or ends.

“ The more sagacious animals may be taught to
 “ do many things which they do not by instinct.
 “ What they are taught to do they do with more
 “ or less skill according to their sagacity or their
 “ training: but in their own arts they need no
 “ teaching or training, nor is the art ever improved
 “ or lost. Bees gather their honey and their wax,
 “ they fabricate their combs, and rear their young
 “ at this day neither better nor worse than they did
 “ when Virgil sang so sweetly of their works.

“ The work of every animal is indeed, like the
 “ other works of nature, perfect in its kind, and can
 “ bear the most critical examination of the me-
 “ chanic or mathematician. The structure of the
 “ cells of bees has been proved to have been made
 “ in the best possible form for compactness, soli-
 “ dity, economy of space and materials that could
 “ be adopted. Bees work geometrically without
 “ any knowledge of geometry, somewhat like a
 “ child, who, by turning the handle of an organ,

“ makes good music without any knowledge of
 “ music. The art is not in the child but in him
 “ who made the organ. In like manner, when a
 “ bee make its combs so geometrically, the geo-
 “ metry is not in the bee, but in that great Geo-
 “ metrician who made the bee, and ‘ made all
 “ things in number, weight, and measure.’ ”

Mr. Barclay also, in his Inquiry on Life and Organization, considers this uniformity of the arts of animals as the chief constituent distinction of instinct from reason. “ With the exception of man
 “ alone,” he says, “ every other species of animals
 “ inhabiting a country, so long as the face and
 “ climate of a country, continue the same, adheres,
 “ without the slightest variation, to the habits,
 “ manners, and fashions and pursuits of other times.
 “ No attempt is ever seen in them to invent new
 “ methods of constructing their buildings, new
 “ modes of training offspring or procuring food, or
 “ any thing that had not been common to the spe-
 “ cies from countless generations.”

Smellie divides the instincts of the lower animals into three classes: 1st, Pure instincts; 2d, Those which can adapt themselves to peculiar circumstances and situations; 3. Those which are improveable by circumstances and observation. On considering all I have read and can think on the subject, it appears that these may be reduced to two. The inferior animals act sometimes from pure instinct, but at other times must be allowed to act from reason, though that faculty is possessed by them in a very inferior degree to that of man. I will now give the instances exhibiting the former

and the latter, which have been collected by authors who have treated on this subject.

Nidification, or the building of nests, in birds, is said to be an instance of pure instinct, and it is asserted that all birds not only continue to construct nests exactly like their progenitors, but if brought up separate from their parents, and in different kinds of nests from their own, they will build, when at liberty, a nest exactly of the same form and materials as other wild birds of their species.

There is scarcely any subject in natural history more curious and interesting, or which attracts earlier observation, than the various nests of birds. When we consider the tools with which they work, and the materials of their art, we are astonished at their ingeniously contrived and constructed fabrics.

They differ much, however, in their attention to the structure of their habitations. It is well known that some, as the ostrich, the woodpigeon, and many of the water birds, seem to take very little care about providing a comfortable abode for their young; whilst many of the smaller birds, such as the finches, the wrens, the swallows, build them with consummate art and care, both without and within. Some, to secure themselves from their enemies, build pendulous nests at the end of twigs; some, in the hollows of trees; some, in leaves; cutting materials so like the substance in which they are placed, as quite to elude the eye of their searcher. Thomson has given a most beautifully descriptive picture of their operations.

Some to the holly-hedge
 Nestling repair, and to the thicket some ;
 Some to the rude protection of the thorn
 Commit their feeble offspring : the cleft tree
 Offers its kind concealment to a few,
 Their food its insects, and its moss their nests.
 Others, apart, far in the grassy dale
 Or roughening waste, their humble texture weave.
 But most in woodland solitudes delight,
 In unfrequented glooms, or shaggy banks,
 Steep, and divided by a babbling brook,
 Whose murmurs soothe them all the livelong day,
 When by kind duty fix'd. Among the roots
 Of hazel, pendent o'er the plaintive stream,
 They frame the first foundation of their domes ;
 Dry sprigs of trees, in artful fabric laid,
 And bound with clay together. Now 'tis nought
 But restless hurry through the busy air,
 Beat by unnumber'd wings. The swallow sweeps
 The slimy pool, to build his hanging house
 Intent. And often from the careless back
 Of herds and flocks, a thousand tugging bills
 Pluck hair and wool ; and oft, when unobserv'd,
 Steal from the barn a straw ; till soft and warm,
 Clean and complete, their habitation grows.

The instinct of the tailor-bird is extremely curious. It will not trust its nest to boughs, (as some other birds do,) but, to avoid snakes and monkeys, it picks up a dead leaf, and sews it to the sides of a living one, making use of its bill as a needle, and some fine fibres for its thread ; the lining consisting of feathers, gossamer, and down. The colour of the bird is light yellow, its length three inches, its weight 3-16ths of an ounce ; so that the materials of the nest and weight of the bird are not

likely to draw down an habitation so slightly suspended.

The migrations of birds, fishes, and insects seem to depend on a pure instinct of a very surprising nature. We are, after all our inquiries on this subject, very little informed from whence they come or whither they go, or what regulates the time of going and coming, and what guides their course. They may be always piloted by a succession of visitors, the old leading the young; but who directed the first pilot, except their Almighty Guide the Creator?

I once witnessed a town-bred pigeon turned out of a cage on Magdalen bridge in Oxford, for a wager, laid against its reaching London in a given time. It flew at first towards the north, and, after several girations in the air, it flew directly to the east, and reached London within the appointed time, which was, I believe, three hours.

Darwin says, 1. “ All birds of passage can exist
 “ in the climates where they are produced. 2. They
 “ are subject in their migrations to the same acci-
 “ dents and difficulties that mankind are subject to
 “ in navigation. 3. The same species of birds mi-
 “ grate from some countries and are resident in
 “ others. From all these circumstances, it appears
 “ that the migrations of birds are not produced by a
 “ necessary instinct, but are accidental improve-
 “ ments, like the arts amongst mankind, taught by
 “ their cotemporaries or delivered by one genera-
 “ tion to another.”

Incubation is another example of pure instinct.
 “ How should birds know that eggs contain their

“ young?” says Paley. “ There is nothing either
 “ in the aspect or the internal composition of an
 “ egg which leads even the most daring imagination
 “ to conjecture that it was hereafter to turn out
 “ from under its shell a living perfect bird. The
 “ form of the egg bears not the remotest resem-
 “ blance to that of the bird. But admit the bird
 “ by some means to know that within that egg
 “ was concealed the principle of a future bird ;
 “ from what chymist was she to learn that warmth
 “ was necessary to bring it to maturity, or that the
 “ degree of warmth imparted by the temperature
 “ of her own body was the degree required?

“ There is another case of oviparous economy,
 “ which is still less likely to be the effect of reason
 “ or education than it is even in birds, namely,
 “ that of moths and butterflies, which deposit their
 “ eggs in the precise substance, that of a cabbage
 “ for example, from which, not the butterfly itself,
 “ but the caterpillar which is to issue from her
 “ egg, draws its appropriate food. The butterfly
 “ cannot taste the cabbage ; yet in the cabbage,
 “ not by chance, but studiously and electively, she
 “ lays her eggs. There are, amongst others, the
 “ willow-caterpillar and the cabbage-caterpillar, but
 “ we never find upon a willow the caterpillar which
 “ eats the cabbage ; nor the converse.”

Insects seem to be endowed with an exquisite-
 ness of instincts, (according to Mr. Spence,) to
 which the higher orders of animals can lay no
 claim. What bird or fish, for example, catches its
 prey by means of nets so artfully woven, and ad-
 mirably adapted to their purposes, as any that ever

fisherman or fowler fabricated? Yet such nets are constructed by the race of spiders. What beast of prey thinks of digging a pitfall in the track of the animals which serve it for food, and at the bottom of which it conceals itself, patiently waiting till some unhappy victim is precipitated down the sides of its caverns? Yet this is done by the antlion and another insect. Or, to omit the endless instances furnished by wasps, ants, the termites, &c., what animals can be adduced, which, like the hive-bee, associating in societies, build regular cities composed of cells, composed with geometrical precision, divided into dwellings adapted in capacity to different orders of the society, and store-houses for containing a supply of provision?

Bees make cells of three different dimensions, for holding workers, drones, and females; and the queen bee in depositing her eggs distinguishes the three kinds, and never puts a royal or a drone egg into the cells destined for the working-bees. What is equally singular is, that the number of these cells is proportioned to that of the different bees to be produced. When there are several females in a hive, the bees work little till all the females but one are destroyed: if more than a single female were allowed to remain in a hive, a greater number of eggs would be laid than the working-bees would be able to make cells for receiving them.

The bees of that species which build cylindrical nests with rose-leaves exhibit a very peculiar instinct. They first dig a cylindrical hole in the earth. When that operation is finished, they go in quest of rose-bushes; and after selecting leaves

proper for their purpose, they cut oblong, curved, and even round pieces, exactly suited to form the different parts of the cylinder.

The solitary wasp collects green-worms, which it deposits with its eggs, so as to provide for the future young, though the parent does not eat animal food itself. Ichneumon flies and wasps do the same.

A curious instance of the display of pure instinct is exhibited in caterpillars, which shaken off a tree where they were born, climb up again, though never on the surface of the ground before.

The spider dermestes and many insects of the beetle kind exhibit an instinct of a very uncommon nature. When put in terror by the touch of a finger, the spider runs off with great swiftness; but if he finds that whatever direction he takes he is opposed by another finger, he then seems to despair of being able to escape, contracts his limbs and body, lies perfectly motionless, and counterfeits every symptom of death. In this situation spiders will suffer themselves to be pierced with pins, and torn to pieces, without their discovering the smallest sign of pain. This simulation of death has been ascribed to a strong convulsion or stupor occasioned by terror: but this solution of the phenomenon is erroneous. It has been repeatedly tried and proved, that if the object of terror be removed, in a few seconds the animal runs off with great rapidity. Some beetles, whilst counterfeiting death, are said to suffer themselves to be gradually roasted without moving a single joint.

Very many more instances of pure instinct might

be collected from the classes of various kinds of the lower animals ; but I will now proceed to detail some of their acts which seem to arise from the faculty of reason, which, if you take Dr. Johnson's definition of it, "the deduction of one proposition from another, or the inference of consequences from premises," or Locke's, "the power of drawing an inference from a comparison of ideas," must lead one to conclude that they are not devoid of this intellectual power.

Mr. Spence remarks, "we cannot reasonably suppose insects to be gifted with instincts adapted for occasions that are never likely to happen. If therefore we find them in these extraordinary and improbable emergences still availing themselves of the means apparently best calculated for ensuring their objects ; and if in addition they seem in some cases to gain knowledge by experience, if they can communicate information to each other, and if they are endowed with memory, it appears impossible to deny that they are possessed of reason." In proof of these positions he produces the following facts.

Professor Fischer has published an account of a hen, (which he has figured, and which he states to have had an outline of countenance so like an old woman, that an Hindoo might have supposed it was a transmigrated hen-wife,) which hen made use of the artificial heat of a hotbed to hatch her eggs.

He next quotes a fact stated by Reaumur, of some ants, which, finding they could derive heat from a bee-hive, contrived to avail themselves of it

by placing their larvæ between the hive and an exterior covering. Neither instinct or any modification of instinct could have taught the ants to avail themselves of a good fortune which but for the invention of glass hives would never have offered itself to a generation of these insects since the creation.

There is no surer criterion of reason, than after having tried one mode, of accomplishing it by another. Dr. Darwin observed a wasp with a large fly nearly as big as itself; finding it too heavy, it cut off the head and abdomen, and then carried off the remainder with the wings attached to it into the air; but again finding the breeze act on the wings, and impede its progress, it descended, and deliberately cut off the wings. Instinct might have taught it to cut off the wings of all insects previous to flying away with them; but here it attempted to fly with the wings on, was impeded by a certain cause, discovered what this cause was, and alighted to remove it. Is not this a comparison of ideas, and deducing consequences from premises?

In proof that animals gain knowledge from experience, Huber observed humble-bees, who, after making vain efforts to insert their probosces into the long tubes of the flowers of beans, pierced the calyx with the horny parts of their mandibles, and flew afterwards from flower to flower, regularly performing the same practice, and extracting the honey from without; whilst smaller bees, or those with longer probosces, entered in at the top of the corolla.

In proof that they communicate and receive

information, he mentions a fact related by Dr. Franklin, who finding some ants in a pot of treacle, nearly emptied it, and hung it by a string to the ceiling. One ant remained at the bottom of the pot, and having well feasted, he marched along the string, gave information to his comrades of the way to the treacle, and soon a large party returned to the feast by the same route the informant had taken.

That they have memory he proves by bees returning from long distances to their cells ; and that this is a local memory is shewn by their fixing on another hive, if placed there, instead of their own, by an intentional transposition of hives^c.

That inferior animals act from some faculty different from intelligence is asserted from the uniformity of their operations : but their operations are not always uniform ; on the contrary, they are adapted to situation and circumstances, as Huber proved by frequent experiments on bees, which constructed their hives differently by compulsion.

The wasp of this country fixes his habitation under ground, that he may not be affected with the various changes of the climate ; but in Jamaica he hangs it on the bough of a tree, where the seasons are less severe.

^c There is a curious treatise of Plutarch entitled *De Solertia Animalium*. He cites a work on the subject of instinct by Cleanthus, who, though he did not think that brutes acted from reason, mentions a fact which he witnessed, of a compact between one body of ants, which gave up the dead body of a captured ant on condition of a worm, which was brought and delivered on the surrender of the body. It contains many stories as probable as this.

M. de la Loubiere, in his relation of Siam, says, that “in a part of that kingdom which lies open to
“ great inundations all the ants make their settle-
“ ments on trees; no ants’-nests are to be seen any
“ where else.” Whereas in our country the ground is their only habitation.

From the scriptural accounts of these insects one might be led to suspect that in some climates they lay up a provision for the winter. (Prov. vi. 6. xxx. 25.) Origen affirms the same; but in this country it is generally believed they do not.

The white-ants of the coast of Africa make themselves pyramids, with a smooth surface of rich white clay, eight and ten feet high, looking like the huts of negroes at a distance.

The black-ant of Fernando Po forms its nest in a columnar form, with a kind of umbrella roof, to protect it from heavy rains, not uncommon in that climate.

The ostrich has been accused of unnaturalness, because she leaves her eggs to be hatched by the heat of the sun. In Senegal, where the heat is great, she neglects her eggs during the day, but sits on them at night. At the Cape of Good Hope, however, where the degree of heat is less, the ostrich, like other birds, sits upon her eggs both day and night.

Rabbits dig holes in the ground for warmth and protection; but after continuing long in a domestic state, that resource being unnecessary, they seldom burrow.

In countries where monkeys abound, many birds, which in other climates build in bushes and the

clefts of trees, suspend their nests upon slender twigs, and by this ingenious device elude the rapacity of their enemies.

Mr. Smellie had a cat which frequented a closet, the door of which was fastened by a common iron latch. A window was situated near the door. When the door was shut, the cat gave itself no uneasiness : as soon as she was tired of her confinement, she mounted on the frame of the window, and with her paw dexterously lifted up the latch and came out.

Dr. Gall says that dogs learn to understand, not merely separate words, or articulate sounds, but whole sentences expressing many ideas. Dr. Elliotson, the learned translator of Blumenbach's *Physiology*, quotes the following passage from Gall's treatise *sur les Fonctions du Cerveau*, without expressing any doubt of the truth of the circumstance : “ I
 “ have often spoken intentionally of objects which
 “ might interest my dog, taking care not to mention his name, or make any intimation or gesture
 “ which might awaken his attention. He however
 “ shewed not less pleasure or sorrow, as it might be ;
 “ and indeed manifested by his behaviour that he
 “ had perfectly understood the conversation which
 “ concerned him. I had taken a dog from Vienna
 “ to Paris ; in a very short time it comprehended
 “ French as well as German, of which I satisfied
 “ myself by repeating before it whole sentences in
 “ both languages.”

We have heard an instance of this quickness in the comprehension of language which is very remarkable. A mongrel, between a shepherd's dog and

a terrier, a great favourite in a farm-house, was standing while its mistress was washing some children. Upon asking a boy, whom she had just dressed, to bring his sister's clothes from the next room, he pouted and hesitated. "Oh then," said the mother, "Mungo will fetch them." She said this by way of reproach to the boy, for Mungo had not been accustomed to fetch and carry. But Mungo was intelligent and obedient, and without further command he brought the child's frock to the astonished mistress. This was an effort of imagination in Mungo, which dogs certainly possess in a considerable degree. He had learned by experience the business of dressing the children, and the instant he was appealed to, he guessed what his mistress wanted.

Linnæus has made it a characteristic of dogs that they bark at beggars; but they learn by experience that beggars are ragged, and sometimes have that look of wildness which squalid poverty produces; and then the imagination of the dog sees in the poor mendicant a robber of his master's house, or one who will be cruel to himself; on this account he expresses his own fears by his bark. A dog is thus valuable in watching property in proportion to the ease with which he is alarmed. One of the greatest terrors of a domesticated dog is a naked man, because he is an unaccustomed object. The sense of fear is said to be so great in this situation, that the fiercest dog will not even bark. A tan-yard at Kilmarnock in Ayrshire was a few years ago extensively robbed by a thief, who took this method to overcome the cou-

rage of a powerful Newfoundland-dog, who had long protected a considerable property. The terror which the dog felt at the naked thief was altogether ill-founded; for the naked man was less capable of resisting the attack of the dog than if he had been clothed: but then the dog had no support in his experience. His memory of the past did not come to the aid of that faculty which saw an unknown danger in the future.

The faculties of quadrupeds, like some of men, are of course mixed in their operation. The dog who watches by his master's grave, and is not tempted away by the caresses of the living, employs both his memory and imagination in this act of affection. In the year 1827 there was a dog constantly to be seen in St. Bride's church-yard, Fleet-street, which for two years had refused to leave the place where his master was buried. He did not appear miserable; he evidently recollected their old companionship, and he imagined that their friendship would again be renewed. The inhabitants of the houses round the church daily fed the poor creature, and the sexton built him a little kennel; but he would never quit the spot, and there he died.

Old greyhounds shew such cunning in catching their prey as seems to be an exertion of power beyond instinct.

Pointers, if frequently disappointed by a bad sportsman, will run home, considering it a waste of toil and sagacity to work any longer for them.

A dog having examined two of three ways in pursuit of his master, immediately takes the third,

arguing logically, that on the presumption of his having gone forward, this must have been his route.

A dog which had been charitably cured by a surgeon brought another lame dog to his door some time afterwards as a patient.

A dog in a monastery perceiving that the monks received their meals by rapping at a buttery-door, contrived to do so likewise ; and when the allowance was pushed through, and the door shut, ran off with it. This was repeated till the theft was detected.

Elephants at the word of command are taught to pick up money, and give it to their keeper ; to unlock bolts, and do various things which shew memory, comparison, and inference. They likewise frequently exhibit proofs of vindictive and of grateful memories.

Dogs and erudite pigs discriminate cards, and obey so many signals and commands by the voice, as would lead one almost to believe that they really comprehend articulate language.

The stories of the sagacity of dogs are innumerable. Those which are taught to lead and beg for beggars, to receive and pick up money, and put it in their master's hat, afford continual amusement to the idle.

They have been also known to manifest a perfect consciousness of their iniquity, and to adopt most crafty methods to conceal it, of which the following is a well authenticated instance.

A dog belonging to Mr. Taylor, a clergyman, who lived at Colton, near Wolseley Bridge, was

accused of killing many sheep. Complaints were made to his master, who asserted that the thing was impossible, because he was muzzled every night. The neighbours persisting in the charge, the dog one night was watched, and he was seen to draw his neck out of the muzzle, then to go into a field, and eat as much of a sheep as satisfied his appetite. He next went into the river to wash his mouth, and returned afterwards to his kennel, put his head into the muzzle again, and lay very quietly down to sleep. This looks like a consciousness of doing what he ought not to do, and a determination to satisfy his appetite by stealth.

A similar story is told of a horse, that would open a latch at night, leave his stable, and feed on a neighbouring field of oats, and when satisfied return to his stable and shut the door.

“There seems a mixture of reason and instinct,” says Miss Wakefield, “which differs widely from
 “that pure instinct that never deviates from its
 “rule, and is chiefly observed in the inferior order
 “of animals, such as insects, reptiles, and zoo-
 “phites. The elephant, the horse, and the dog
 “are peculiarly intelligent; instinct is in them on
 “many occasions subordinate to a mental capacity
 “approaching to the reasoning powers of man.
 “Could the habits of all creatures be intimately
 “known, it might be easy to trace the gradations
 “from reason to pure instinct; but the fierce in-
 “habitants of the forest, and those that dwell in
 “the depths of the ocean, besides numerous tribes
 “that are driven by fear into the remotest soli-
 “tudes, are secluded from that notice which is
 “requisite to ascertain the degrees of intelligence

“ that is bestowed on them. But from what is
 “ known it appears that the superior orders of
 “ quadrupeds, and especially those that associate
 “ with man, are the most sagacious. Birds also
 “ enjoy this privilege very highly, when the pro-
 “ tection of their young is concerned. Mr. Galton,
 “ in his very entertaining work on birds, remarks,
 “ that blackbirds generally build low in bushes, or
 “ in trees that are not very high ; and he mentions
 “ an instance of a bird of this species, after having
 “ built its nest twice near the bottom of a hedge,
 “ and both hatches of its young falling a prey to
 “ cats, the third time she placed it in an apple-
 “ tree, eight feet from the ground. To what can
 “ this be attributed, but to the effects of experience
 “ and design? Mere instinct teaches finches to
 “ build in green hedges, to cover their habitation
 “ with green moss ; the swallow or martin, that
 “ builds against rocks or houses, to cover theirs
 “ with clay ; and the lark, to collect straw for the
 “ same purpose, as approaching to the colour of
 “ stubble, amongst which she builds. But should
 “ either of these birds change the colours of the
 “ material of their nests on account of a different
 “ situation, I should attribute that alteration to an
 “ higher principle, by varying the mode of com-
 “ pliance with the instincts of nature. The devia-
 “ tion from the usual course would mark a choice,
 “ and therefore be superior to the natural impulse
 “ that guides the parent bird to build the nest after
 “ a peculiar manner.”

I have said nothing of the instincts of fishes,
 not the least curious probably, though the least
 known. The instinct of the salmon tribe, in

swimming up streams, and leaping over torrents, and digging holes to bury their eggs, where they may be protected, is a very striking example of the strong impulse of the instinctive principle. Herrings and mackerel are supposed to frequent our coasts for this purpose of depositing their spawn.

Fishes are said to use some crafty means of circumventing their prey, which shew a mixture of the rational principle mixed up with instinct.

It is well known how readily horses adapt their movements in battle and elsewhere to the word of command. Any one who has seen their performances at Astley's, and particularly the scenic representation of one in the character of the high-mettled racer, must have been astonished at the readiness of their comprehension and obedience.

As a curious instance of mixed instinct and reason, I quote the following amusing statement from the Rev. John Hall's Travels in Scotland.

“ Whilst I was travelling in Scotland, as I was
 “ one day amusing myself with the objects within
 “ my view on the road between Huntley and Port-
 “ soy, I observed two magpies hopping round a
 “ gooseberry bush, in a small garden near a poor
 “ looking house, in a peculiar manner, and flying
 “ in and out of the bush. I stepped aside to see
 “ what they were doing, and found from the poor
 “ man and his wife, that as there are no trees all
 “ around, these magpies several succeeding years
 “ had built their nest, and brought up their young,
 “ in this bush; and that foxes, cats, hawks, &c.
 “ might not interrupt them, they had barricadoed
 “ not only their nest, but had encircled the bush
 “ with briars and thorns in a formidable manner;

“ nay, so completely, that it would have cost even
 “ a fox, cunning as he is, some days’ labour to get
 “ into that nest.

“ The materials in the inside of the nest were soft,
 “ warm, and comfortable; but all on the outside, so
 “ rough, so strong, and firmly entwined with the
 “ bush, that without a hedge-knife, hatch-bill, or
 “ something of the kind, even a man could not with-
 “ out much pain and trouble get at their young, as
 “ from the outside to the inside of the nest extended
 “ as long as my arm. They fed the young brood
 “ with frogs, mice, worms, or any thing living with-
 “ in their power to subdue. It once happened that
 “ one of the magpies having seized a rat, which it
 “ was not able to kill, one of the young ones came
 “ out of the nest to its mother and the rat, while
 “ they were fighting on the outside of the bush,
 “ and assisted her to kill it, which they were not
 “ able to accomplish till the father also arriving
 “ with a dead mouse, also lent his aid. These
 “ magpies had been faithful to one another for
 “ several summers, and drove off their young as
 “ well as every one else, who attempted to take
 “ possession of their nest.

“ This they carefully repaired and fortified in the
 “ spring with strong rough prickly sticks, that they
 “ sometimes brought to it by uniting their force,
 “ one at each end pulling it along, when they were
 “ not able to lift it from the ground.”

Here is an instance where extraordinary skill and labour are exerted beyond the usual ingenuity in constructing their nests; adapted to the more than common necessity for its defence in the situation in which it was placed.

From these and various other instances which might be adduced, it appears highly probable that animals, besides pure instinct, have the power of acquiring, retaining, remembering, and comparing ideas, and that they act from such combinations.

“Brute animals have many instincts, denied to man, because the want of them can be supplied by education. An infant must be taught to walk; and it is long before it acquires the art in perfection. Brutes have no teacher, but nature; a foal directly it sees the light can walk; partridges and lapwings can run.” *Dente lupus : cornu taurus petit-unde? Nisi intus monstratum.*—Lord Kames, *History of Man*.

The same author says, “But though reason and experience have little influence on brute animals, they undoubtedly possess the faculty. A beast of prey would be ill fitted for his station, if nature did not teach it what creatures to attack, and what to avoid. A rabbit is the prey of a ferret. Present a rabbit even to a young ferret, that never had seen a rabbit, it throws itself upon the body, and bites it with fury. A hound has the same faculty with respect to a hare, and most dogs have it. Unless directed by nature, innocent animals would not know their enemies till they were in their clutches. A hare flies with precipitation from the first dog it ever saw; and a chicken, upon the first sight of a kite, cowers under its dam.

“Social animals, without scruple, connect with their own kind; and as readily avoid others. Birds are not afraid of quadrupeds, not even of a cat, till taught by experience that a cat is their

“ enemy. They appear to be as little afraid of
 “ man, naturally, and on that account are far from
 “ being shy when left unmolested. In the unin-
 “ habited island of Vesia Grande, one of the Philip-
 “ pines, Kœmpfer says that birds may be taken
 “ by the hand. Hawks, in some of the South Sea
 “ Islands, are equally tame. At port Egmont, in
 “ the Falkland Islands, geese, far from being shy,
 “ may be knocked down with a stick. The birds
 “ that inhabit certain rocks hanging over the sea,
 “ in the island of Annabon, take food readily out
 “ of a man’s hand. In Arabia Felix foxes and
 “ apes show no fear of man, the inhabitants of
 “ hot countries having no notion of hunting. Doth
 “ not this observation suggest a final cause? A
 “ partridge, a plover, a pheasant, would be lost to
 “ man for food, were they naturally as much afraid
 “ of him as a hawk or a kite.”—Lord Kames, *His-
 tory of Man*.

That beasts have grateful and vindictive memories is confirmed by many stories of elephants ; one of which collected water to swill a tailor, who had injured him a long time before he had an opportunity of gratifying his revenge.

An elephant escaped and run into the woods ; it was taken with some wild elephants. On recognizing and being recognized by its keeper, it knelt down to receive him on his back, and went back with him to his picket.

A bull, which took a violent antipathy to a farmer, was exposed to a storm of thunder and lightning in an open stall ; the farmer had the courage to release it, and bring it into a stable. The bull’s antipathy, from that moment, seemed converted

into affection; and it would permit the farmer to take liberties with it, which none of his servants could use.—*Instinct Displayed*.

Mr. Fleming thinks he has cut the knot, by distinguishing instinctive actions from intellectual, by giving them the title of *the active powers*: but this is only a change of name.

Mons. Veréy imagines that he has solved the difficulty by this facetious enigma: “Intelligence
“ connoît qu’elle ignore, et l’instinct ignore qu’il
“ connoît.”

Mons. Seres, in his *Anatomie du Cerveau*, conceives that he has proved that instinct depends on the comparative developement of the fifth pair of nerves. This he inferred from the examination of the skull of a child, which had exhibited the characteristic instinct of sucking, though all the brain was wanting but that from whence the fifth pair of nerves originate. He says also that beavers exhibit these nerves in a particularly developed state; and that insects which have most of nerves analogous to them (“*système nerveuse céphalique*”) display the most of pure instinct: in short, that this faculty is always characterised by a superior developement of these nerves, or something analogous to them. This requires much more investigation, to demand unqualified assent.

Darwin supposes that our superiority to the brutes arises from our superior sense of touch and the superior intensity of volition; Locke, from our power of abstracting and generalizing ideas; of which power Berkeley and Hume altogether deny the existence.

I will not investigate the mystery of human in-

instincts connected with the passions, but must think that Reid has made a strange confusion of terms by attributing many mechanical motions of the body to this faculty.

As organization is traced by anatomists, extending through the nervous system from molecules among the acrita or infusory animals, i. e. polypi, &c., among the radiata, i. e. worms, leeches, &c., to fibres and ganglia among the mollusca, i. e. slugs, to imperfect spinal or knotted medulla among the crustacea, i. e. lobsters and insects, and to spinal marrow connected with a brain in animals of superior faculties and general organization; so the intellectual power seems to exist in combination with a mere power of sensation, gradually expanding from a speck of instinct in the lowest order of living beings, to a gradually increasing degree, till it becomes mingled with minor degrees of reason, and then with greater degrees of the divine infusion, till the diapason closes full in man.
